

Investing in the Navy's Future

By Jacqui L. Barker, Public Affairs Officer Combat Direction Systems Activity Dam Neck

Transforming the Department of the Navy into a "Total Force" often requires asking individuals to work harder and sacrifice more than they ever have in our Navy's history. Personal sacrifice may be required not just of military personnel, but also the civilian workforce, who also support the Chief of Naval Operations Sea Power 21 initiatives and Naval Sea Systems Command (NAVSEA) operations.

This type of commitment can be found at the Combat Direction Systems Activity Dam Neck, Va. CDSA Dam Neck is a NAVSEA Enterprise Warfare Center within the Naval Surface Warfare Center (NSWC) Dahlgren Division. Its mission is to provide acquisition support, life cycle maintenance, test and delivery for carrier, amphibious, frigate, and non-Aegis combat direction systems, advanced sensor distribution systems, and other software-intensive combat control and electronic intelligence systems.

Two civilian employees, dedicated to the CDSA Dam Neck mission answered a challenge to support NAVSEA's vision to "Put the right capability in the hands of the warfighter at the right time at the right cost."

In response to a request from the Program Executive Office for Integrated Warfare Systems to the NSWC Dahlgren Division for help on CVN 21, the 21st century aircraft carrier program, Allen Morrison and Kevin Long volunteered to assist the PEO IWS located at the Washington Navy Yard.

The CVN 21 program is the future aircraft carrier replacement program for USS Enterprise and CVN 68-class aircraft carriers. A centerpiece of the Sea Strike pillar, and integral to Sea Shield and Sea Basing, CVN 21 will be the premier forward asset for crisis response and early decisive striking power in major combat operations.

CVN 21 and the carrier strike group will provide rapid response, endurance on station, and multi-mission capability. CVN 21 balances improved warfighting capability, quality of life improvements and reduced acquisition and life cycle costs.

The first new aircraft carrier design in more than 40 years, CVN 21 will share a Nimitz-class hull form with a completely reconfigured internal space arrangement and flight deck layout. Northrop Grumman was awarded a \$108 million contract to begin design of the CVN 21-class nuclear-powered aircraft carrier in 2003. Advance construction began in 2006. Commissioning is expected to be in 2014.

Morrison, an employee from the Combat Direction Systems Branch, spent 17 months providing technical support for CVN 21 initiatives. Long, an employee from the Systems Management Engineering and Analysis Branch, replaced Morrison in the PEO IWS office in October 2005 and will serve for one year.

PEO IWS provides the Navy with fully integrated and certified warfare systems. The CVN 21 class of carriers is the first to have shipboard systems that are totally integrated. Long coordinates and manages the integration and installation of the warfare system within the new CVN 21-class hulls.

"The significance of working on CVN 21 warfare systems is that you are develop-

ing the warfare system for aircraft carriers that will impact our fleet for the next 50 to possibly 100 years," Morrison said.

Morrison served as the senior civilian technical NSWC representative for PEO IWS 1A4B. His tasks included defining requirements, system engineering, program development, systems integration, testing and certification. His responsibilities required an understanding of contracting, budget development and management, and lifetime support engineering.

"The work environment is very dynamic, so there is never a dull moment," Morrison said. "I was able to see first hand the incredible process that makes up the Navy acquisition world and see how complex it really is. This was one of my most challenging assignments."

Long develops technical based reviews to support flag level briefs, coordinates schedules for PEO IWS and PEO Aircraft Carriers. He assists in the management of the warfare system integration contractor. He also leads various working groups to help establish interoperability of the CVN 21 class hulls within the Navy's vision of FORCEnet.

"I have a new respect for the acquisition community. I was able to understand why decisions are made, ones that I could not fully understand before. Additionally, I

July 8, 2005 - Artist's concept of CVN 21 – one of a new class of aircraft carriers. The new nuclear propulsion plant will require fewer operators thereby lowering life cycle costs, and provide increased electrical power that will be available for the demands of developing technology. Smart sensors will assist in further reducing Navy watchstander requirements and in automating damage control functions such as detecting fire and flooding situations. Flight deck redesign and a transition to an advanced aircraft recovery system (AARS) will reduce crew workload, enhance safety and reduce the costs of operating and maintaining a carrier throughout its planned 50-year life cycle. U.S. Navy graphic.



enjoyed the challenge of bringing together a team across three SYSCOMS (systems commands) to give CVN 21 the best warfare system possible and to provide our Sailors with warfare systems that work as advertised. I hope I made a difference in making that happen," Morrison said.

According to Capt. (Sel) James Downey, PEO IWS deputy director for Warfare Systems, Long and Morrison assisted in the program's achievement to Milestone B.

Supporting the largest acquisition program in the Defense Department, they assisted in CVN 21 certification of the C4I support plan; approval of the information support plan; processing hundreds of ship design products within an extremely aggressive schedule; establishment of a warfare system baseline control process; development and employment of sophisticated and repeatable systems engineering processes across industry and government activities, including hundreds of tasks across the NAVSEA, Naval Air Systems Command and Space and Naval Warfare Systems Command claimancies.

It is no wonder that Morrison and Long are proud to be associated with the CVN 21 program. Features of the modernized CVN 21 design include a highly automated propulsion system, electromagnetic aircraft launch and recovery systems, cruise ship automation and direct energy weapons. Each nuclear reactor will provide 25 percent more energy and three times the electrical output than the CVN 68-class carrier.

The air wing will be supported by an F-35C Joint Strike Fighter, F/A-18E/F Super Hornet, E-2C Hawkeye and EA-18G Prowler.

"We needed the best and brightest from the NSWG team and Al and Kevin certainly fit that description. They are truly dedicated, outstanding performers that have been extremely valuable team members of the CVN 21 Warfare System efforts for the CVN 21 program," Downey said.



Visit the CDSA Dam Neck Web site at <http://www.navseadn.navy.mil/>. CHIPS

Aircraft Carriers - CVN 21 Program

Starting with the lead ship, CVN 78, the new class features a multitude of improvements over existing aircraft carriers all designed to improve the combat capability of the Navy's carrier fleet while simultaneously reducing acquisition and life cycle costs.

CVN 78 warfighting capability improvements include: 25 percent increase in sortie generation rate; nearly three-fold increase in electrical generating capacity; and increased operational availability. CVN 78 quality of life improvements will result in improved work spaces, berthing and sanitary facilities; improved food service operations; increased air conditioning capacity; and increased training capabilities.

Even with all the improvements, the Navy expects to see CVN 78 cost reductions including more than \$300 million reduction in procurement costs; more than \$5 billion reduction in life cycle costs and 1,000-1,200 billet reductions in the ship's crew and air wing.

New technologies on board include:

- ✓ New propulsion plant design that includes a 50 percent reduction in the number of personnel required for plant operation and maintenance.

- ✓ Electromagnetic catapults and advanced arresting gear that support future air wing configurations including unmanned air vehicles.

- ✓ Improvements in weapons and material handling designed to more efficiently move ordnance and material around the ship in support of flight operations.

- ✓ New smaller island designed to accommodate Dual Band Radar developed by the DD(X) program.

- ✓ New Integrated Warfare System including flexible ship infrastructure design improvements to support future mission adaptability and flexibility.

Development, design and construction costs (\$5.6 billion) include the non-recurring investment in the design and development of the CVN 78-class. This is comprised of \$3.2 billion in RDT&E funds used to develop technologies to meet program requirements and \$2.4 billion of SCN funds used to develop the detail design for the class. The total cost to build the lead ship is \$8.1 billion in FY08 dollars.

Each ship in the new class will save \$5.3 billion in total ownership costs over its 50-year service life, compared to the CVN 68-class. Half of the total ownership cost for an aircraft carrier is allocated to the direct and indirect costs of manpower for operations and maintenance of the ship.

The CVN 78 is designed to operate effectively with 800 fewer crewmembers than a CVN 68-class ship. Technologies and ship design initiatives that replace maintenance intensive systems with low maintenance systems are expected to reduce watchstander and maintenance workload for the crew. The total ownership cost for a CVN 68-class ship is \$32.1 billion in FY04 constant year dollars; the total ownership cost for CVN 78 is expected to be \$26.8 billion.

General Characteristics CVN 21 Future Aircraft Carrier Program

Propulsion: Two nuclear reactors, four shafts; Length: 1092 feet; Beam: 134 feet; Flight Deck Width: 256 feet; Displacement: approximately 100,000 long tons full load; Speed: 30+ knots (34.5+ miles per hour); Crew: 4,660 (ship, air wing and staff); Armament: Evolved Sea Sparrow Missile, Rolling Airframe Missile, Close-In Weapons System (CIWS); Aircraft: 75+ (JSF, F/A-18E/F, EA-18G, E-2D, MH-60R/S, J-UCAS).

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